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Potential Winterkill Lakes in Walworth, Kenosha, and Racine Counties, Wisconsin, 1935-1975.

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ABSTRACT

A file review was made of the winterkill history of 22 potential winterkill lakes in Walworth, Kenosha, and Racine Counties, Wisconsin. Data from the Bureau of Fish Management's dissolved oxygen monitoring program collected from 1935 to 1975 are presented and related to other characteristics of the lakes and to the weather.

The data revealed trends and frequencies of winterkill on many of the lakes monitored. They also show that winterkill was a recurring natural phenomenon that occurred frequently enough that the fisheries on many of the lakes could be better utilized by the fishing public if fishing regulations were liberalized. Special regulations are proposed that would allow for a better harvest of fisheries that might otherwise be lost to winterkill.

INTRODUCTION

Observations and dissolved oxygen measurements have been made and recorded on winterkill lakes in Walworth, Kenosha, and Racine Counties, Wisconsin, since about 1935 (Fig. 1). In the earlier years, measurements were primarily used to diagnose whether or not a winterkill of the fisheries was taking place. In recent years, measurements were taken to enable the manager to predict the possibility of a kill far enough ahead of time to obtain the necessary authorization to post the lake open to dipnetting, to notify sportsmen and lake residents, and to prepare a news release in time for the fishery to be salvaged. This was the approach taken in 1971 and is the recommended procedure.

The principal objectives of this report are to compile all the known winterkill data on lakes in Walworth, Kenosha and Racine Counties, to depict the trends and characteristics of these lakes, and to formulate a measure of predictability for their future management.

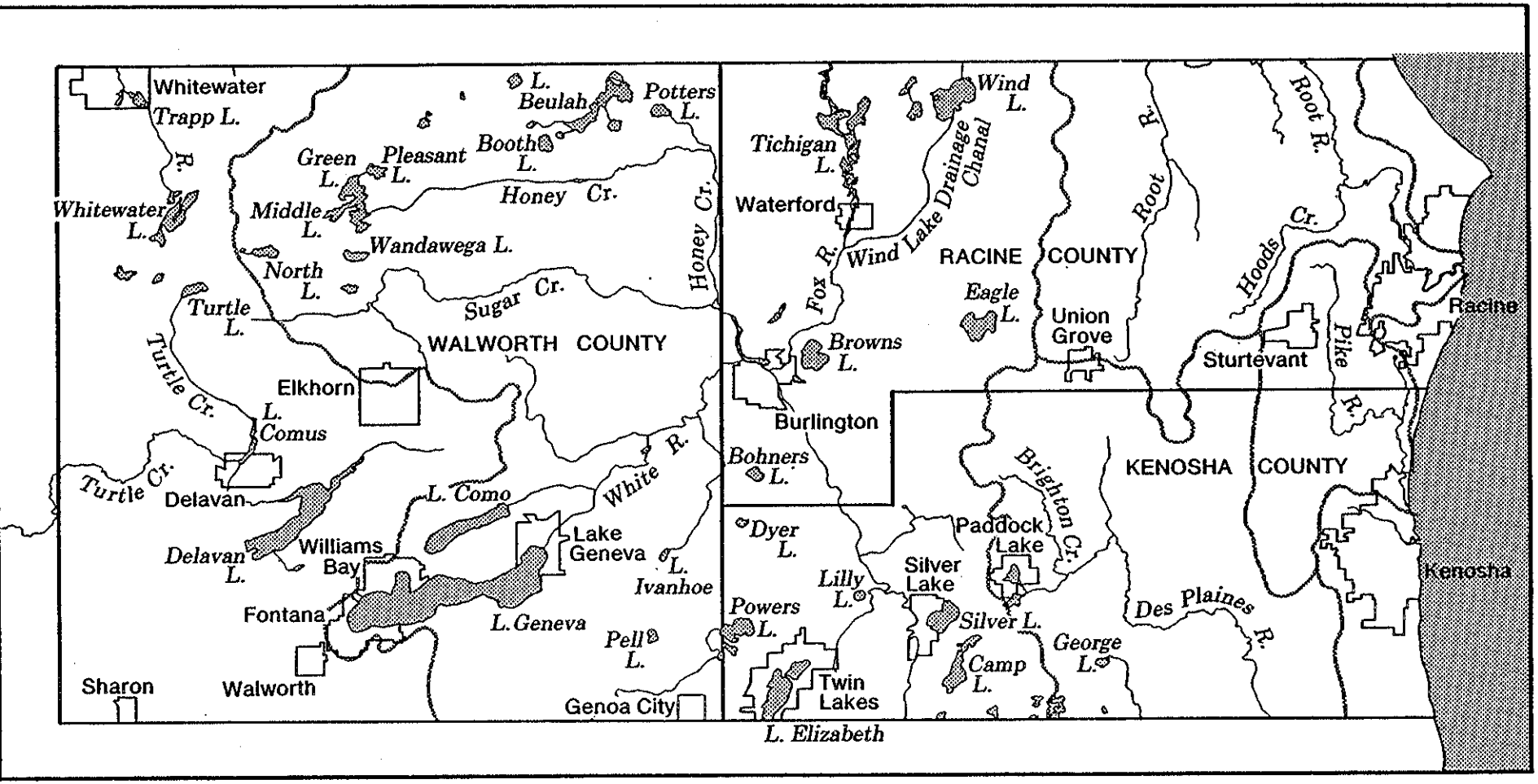

Figure 1 Winterkill lakes on which sampling was completed.

METHODS

In preparing this report, the files on all known winterkill lakes were reviewed and all correspondence was checked for comments and observations on winterkill conditions. The actual monitoring data were copied exactly as they appeared in the various memoranda found in the files. Until recent years, the monitoring program was not conducted in a consistent manner, principally because it was carried out over a long period of time by different managers who had different methods of operation. Important data relating to location, water sample depth, ice thickness and condition, and weather were often lacking. Nevertheless, the objectives of this report were still achieved in that winterkills and their general characteristics were documented. Data from recent years are more consistent and complete and coincide with many of the more recent fishery surveys. Therefore, they are relied upon more heavily in making recommendations for future management.

As far as is known, a Kemmerer water sampler was used to obtain the water samples in the surveys and the dissolved oxygen concentrations were determined by the Winkler or modified Winkler method. Measurements made since the early 1960's were done with a "Hach Kit" which utilizes a modified Winkler method. Most of the measurements were done under field conditions, some of which may have been adverse. Errors may have occurred in some instances because the standardization of the sodium thiosulfate solution was not checked before each survey. However, for our purposes the measurement would still be usable since the primary intent of the field measurement was to determine the trend in dissolved oxygen levels and not the precise amount of dissolved oxygen present. Efforts should always be made to be as precise and as accurate as possible when carrying out any measurements as important as these. It is assumed that this was done by the personnel involved.

RESULTS

Summary of Winterkill Lakes

Potential winterkill lakes are listed in Table 1 along with their physical characteristics and winterkill history. Detailed sampling data for each lake appear in the appendix. The degree of winterkill indicated in the table and subsequent references is as follows: partial - less than 25% of the fish died off; severe - 25 to 100% of the fish died off. Unless a particular game fish species is totally decimated, a winterkill of 25% is generally not significant. The reproductive capacity of the fish population should enable it to make a good comeback from standpoints of population balance and numbers. A winterkill of more than 25% might enable a competitive species, such as carp, to gain control or upset desirable predator-prey relationships. In such cases, restocking the lake may help restore this balance, provided that other requirements for such action are met. These are general deductions based on past experience and therefore are only meant for general application. They may or may not be applicable to a specific winterkill situation since there may be other factors for the fishery manager to consider.

Narrative Description of Winterkill Lakes

A brief narrative on each lake follows describing its past history, present management, and recommendations for future management. The lakes are listed in alphabetical order for the three-county area.

CAMP LAKE, KENOSHA COUNTY

Winterkill History. This lake has been on the winterkill list for at least 25 years. The last recorded severe winterkill occurred in 1952. Records also indicate that partial kills probably occurred in 1959 and 1971. Dissolved oxygen monitoring has been done irregularly from 1951-56 and annually since 1969. It can be expected to have a partial winterkill an average of at least once every 10 years.

Present Management. The principal fishery consists of northern pike, walleyes, largemouth bass, and panfish. Walleye fingerling were stocked beginning in the early 1960's and up to 1969. Natural reproduction for this species is believed to be very poor. Past surveys indicate large numbers of sub-legal northern pike that are growing slowly. There is a considerable amount of ice fishing and open water fishing for northern pike, bass, and panfish. It is one of the more important fishing lakes in Kenosha County.

Future Management. Dissolved oxygen monitoring should be carried out each winter and measurements made according to previous weather conditions. Such information will aid in the future management of the lake and public relations with local residents and sportsmen's clubs. Because of its large size, important sport fishery and lack of major winterkills in recent years, it is recommended that more liberal regulations for gamefish not be instituted at the present time pending further investigation.

COMO LAKE, WALWORTH COUNTY

Winterkill History. Winterkills of various degrees have been recorded over the last 40 years. The last recorded severe winterkill occurred in 1936. Partial kills occurred in 1951, 1959, 1962, and 1971. The lake was chemically treated and the total fishery eliminated in 1956. Dissolved oxygen monitoring has been done since 1951 and annually, with the exception of three years, since 1959. It can be expected to have a partial winterkill an average of at least once every 10 years.

Present Management. It is managed for northern pike, largemouth bass, channel catfish, and panfish. A private stocking of channel catfish was made in 1974. Otherwise no stocking has been done since just after the chemical treatment in 1956. Recent surveys indicate good northern pike and largemouth bass populations and large numbers of small panfish. There is a considerable amount of ice fishing for northern pike and there is an excellent open water bass fishery. It is one of the best fishing lakes in Walworth County.

Future Management. Dissolved oxygen monitoring should be carried out each winter with measurements made according to previous weather conditions. Such information can be used for both management and public relations purposes. Because of its large size, important sport fishery, and lack of major winterkills in recent years, it is recommended that more liberal fishing regulations for all species not be instituted at the present time pending further investigation.

COMUS LAKE, WALWORTH COUNTY

Winterkill History. Only one winterkill has been recorded on this lake. It occurred in 1959. Measurements have been taken occasionally since then but dissolved oxygen levels were high. Heavy vegetative growth in the lake prior to the 1959 kill may have been a factor. Since 1959, carp have controlled the vegetation. Also, the waters have become shallower due to siltation, causing water turnover rates to increase and thereby reduce the possibility of a winterkill. Nevertheless, it can be expected to winterkill once every 20 years.

Present Management. It is managed for largemouth bass, northern pike, and panfish. It has a carp problem and contains a large population of small perch, bluegills, and crappies. It has not been stocked since just after the last winterkill. There is considerable ice fishing and bank fishing by local residents. It can be considered as one of the more important fishing spots in the Delavan area.

Future Management. Its relative infrequency of winterkill and good turnover rate probably do not warrant an annual monitoring of dissolved oxygen levels. Observations on snowfall and ice thickness should be kept, and during severe winters dissolved oxygen measurements should be made. No special regulations are recommended.

DYER LAKE, KENOSHA COUNTY

Winterkill History. Monitoring has taken place inconsistently since 1951 when a partial winterkill probably took place. It has been monitored annually since 1969. A severe winterkill took place in 1971. Some panfish were stocked by local sportsmen, under state supervision, after the 1971 kill. No game fish were restocked because there is no public access. Some game fish are believed to have survived the kill to repopulate the lake. A severe winterkill can be expected an average of once every 10 years.

Present Management. Management is for largemouth bass, northern pike, and panfish. There have been no surveys since the 1971 winterkill, but fishermen report all species present before the kill are present now. When the public can get on the lake, fishing pressure is considerable, especially during the winter. Because there is no public access, this lake does not rank as an important sport fishing lake.

Future Management. In order to maintain up-to-date records and provide information for future management, it is recommended that the dissolved oxygen monitoring be continued and that the lake be checked at least once every winter depending upon ice and snow cover. It is also recommended that a year-round fishing season be established with no bag or size limits for all species.

IVANHOE LAKE, WALWORTH COUNTY

Winterkill History. A monitoring program has been carried out irregularly from 1959-1970. From 1970 to 1975 the lake was monitored annually. There was a partial winterkill in 1971. This was the only recorded winterkill but a partial winterkill probably took place in 1959. From past data it can be expected to partially winterkill an average of at least once every 10 years.

Present Management. Managed for largemouth bass, northern pike, and panfish. At times good catches of large panfish are reported. There is consistent ice fishing pressure throughout the winter months. It can be considered only a good fishing lake because of limited access especially during the open water season. Stocking has never been warranted.

Future Management. A continuation of the dissolved oxygen monitoring program is recommended to aid in management. A severe winterkill is unlikely because there is a continuous outflow throughout the year. A year-round season with no size limits for all species is recommended with no bag limit on all panfish. If better public access during the open water season is provided, stocking is recommended after a winterkill because of the probability of the ingress of carp from its outlet.

LILLY LAKE, KENOSHA COUNTY

Winterkill History. Records of winterkill date back to 1936. Severe winterkills occurred in 1936, 1940, 1945, 1951, and 1959. A partial winterkill probably occurred in 1971. Inconsistent dissolved oxygen records have been kept from 1941 to 1966 and consistently from 1969 to 1975. It can be expected to winterkill an average of once every 10 years. An inland lake renewal district has been formed which plans to dredge the lake to make it deeper.

Present Management. It is managed for largemouth bass, northern pike, and panfish. The precise condition of the fishery is unknown. It is believed to be marginal because of the shallowness of the basin. Fishing pressure is minimal and it can be considered as one of the poorer lakes for sport fishing. Public access is limited during the open water season and is related to the lack of fishing pressure.

Future Management. The lake is heavily developed and local people and sportsmen are interested in its status. A dredging project may be undertaken within several years. For these reasons it should be monitored for dissolved oxygen levels. Also, if levels are found to indicate that a winterkill is imminent, the lake can be posted open to dipnetting for salvaging purposes and to maintain public credibility. Until a dredging project alleviates the winterkill potential, a year-round season with no bag limits or size limits for all species is recommended.

LONG LAKE, RACINE COUNTY

Winterkill History. There is no recorded winterkill even during the severe winters of 1951 and 1959. There was probably a partial kill in 1971. Dissolved oxygen monitoring has been done irregularly from 1941 to 1975. Efforts were made in recent years to monitor it annually. It is connected to Brock Lake on its upper end and has a perennially flowing outlet to the Fox River. The continual changeover of its waters probably saves it from winterkill in severe winters. However, it can be expected to winterkill an average of once every 10 years.

Present Management. It is managed for largemouth bass, northern pike, and panfish. Its direct connection with the Fox River allows for the reintroduction of most fish species should there be any winterkill and for this reason it is one of only six winterkill lakes that is known to contain carp. Catches of large bluegills and other panfish have been reported, but fishing pressure can be considered low due to restricted public access. It is rated as a better than average fishing lake.

Future Management. A continuation of the winter monitoring is recommended to maintain up-to-date records for future management. A severe winterkill may require game fish stocking and substantiation for posting the lake open for dipnetting for salvaging purposes. Therefore, there is additional justification for such a monitoring program. A year-round fishing season with no size limit is recommended for all species. No bag limit is recommended for all panfish.

LORRAINE LAKE, WALWORTH COUNTY

Winterkill History. Records indicate that severe winterkills probably occurred in 1954, 1959, 1963, 1970, and 1971. Dissolved oxygen monitoring has been done inconsistently each year from 1956 to 1967 and on an annual basis since 1969. Record heavy rains in 1973 caused water levels to come up to record highs. Presently, water levels are receding and severe winterkill conditions can be expected to return within three years. This lake can be expected to winterkill an average of once every five years.

Present Management. Large fingerling largemouth bass and northern pike were stocked in 1971 and 1975, respectively. Adult channel catfish were stocked in 1975. There has been a good sport fishery for bass since 1973 and northern pike and catfish fishing was expected to be good in 1976. Fishing pressure has been good for bass and it now ranks as one of the best bass fishing lakes in Walworth County.

Future Management. It is recommended that dissolved oxygen monitoring be continued on an annual basis in anticipation that the lake may need to be posted open for dipnetting as water levels get closer to normal. A year-round fishing season and no bag and size limits for all species is recommended.

MONTGOMERY LAKE, KENOSHA COUNTY

Winterkill History. The only winterkills recorded were a partial one in 1959 and a probable partial in 1971. A dissolved oxygen monitoring program has been carried out inconsistently since 1941. It has been monitored annually since 1969. It can be expected to partially winterkill an average of once every 10 years.

Present Management. It is presently managed for largemouth bass, northern pike, and panfish. Reports from fishermen suggest that growth rates are normal or above normal for the county. There has been no stocking for at least the last 18 years. Fishing pressure is high especially through the ice in winter and can be considered as one of the best fishing lakes in the area during the winter season.

Future Management. It is recommended that the dissolved oxygen monitoring program be continued on an annual basis in anticipation of at least a partial kill. Liberal regulations are recommended with a year-round season and no size limits for all species and no bag limit on all panfish.

MUD LAKE, KENOSHA COUNTY

Winterkill History. Monitored inconsistently for dissolved oxygen since 1969. Partial winterkills probably occurred in 1951, 1959, and 1971. It can be expected to partially winterkill an average of once every 10 years.

Present Management. It is managed for largemouth bass, northern pike, and panfish. Fishing pressure is unknown but occasionally there have been reports of large bass caught in the open water season. There are no records that it has ever been stocked. It can be considered a relatively unimportant public fishing lake mostly because of its small size and lack of a good public access.

Future Management. Dissolved oxygen monitoring should be carried out only in severe winters unless additional data is considered important. In that case, it should be monitored every year. There may be environmental considerations in the future which may require up-to-date data. A brief netting or electrofishing survey is suggested to give the dissolved oxygen data more meaning. A year-round season with no bag limits or size limits for all species is recommended.

NO. TEN LAKE, WALWORTH COUNTY

Winterkill History. This is a very shallow kettle lake which was frozen solid in 1970 and probably severely winterkilled in 1971. Unless there is heavy precipitation in record amounts, this lake can be expected to winterkill every year. Record rainfall in 1973 may have raised water levels enough to support a fishery.

Present Management. It is managed for panfish and forage species because it probably winterkills every year. If annual winterkill could be prevented it has the potential for producing a highly desirable panfish population.

Future Management. Periodic checks of water levels are recommended to maintain up-to-date records. If water levels remain high enough to prevent a winterkill, dissolved oxygen measurements are warranted to substantiate posting it open for salvaging purposes, if necessary. Public access is lacking which negates any possibilities for restocking and any form of real management. A year-round season with no bag or size limits for all species is recommended.

NORTH LAKE, WALWORTH COUNTY

Winterkill History. Dissolved oxygen monitoring has been done inconsistently since 1955 and annually since 1973. Severe winterkills definitely occurred in 1951, 1958, 1959, 1961, 1963, 1964, 1969, 1970, 1971, and 1972. Partial kills probably occurred in 1965, 1966, 1967, and 1968. It can be expected to winterkill at least once every two years if water levels are low. Heavy rainfall in 1973 raised water levels to record heights and by 1975 there was good fishing for perch and bluegills. When normal precipitation patterns resume water levels will recede and winterkill conditions can be expected to return.

Present Management. Primarily it is managed for panfish but large fingerling northern pike were stocked in 1975 with hopes that they would grow and reproduce to provide some fishing before the next winterkill. Consistent ice and open water fishing pressure has been maintained for the past two years and there have been reliable reports of large bluegills and perch being caught. Presently, it is one of the best lakes for panfishing in Walworth County.

Future Management. An annual dissolved oxygen monitoring program is recommended in anticipation of a severe winterkill that would necessitate opening the lake to dipnetting for salvaging purposes. Summerkill also has a good chance of occurring as water levels go down and the growth of aquatic vegetation increases. A year-round season with no bag or size limits for all species is recommended to assure a better harvest of the fishery. A reconnaissance survey is also recommended to justify the monitoring program.

PELL LAKE, WALWORTH COUNTY

Winterkill History. A dissolved oxygen monitoring program has been conducted inconsistently since 1955 and annually since 1969. Severe winterkills occurred in 1951, 1959, and 1971. A partial kill occurred in 1960. It can be expected to winterkill an average of once every 10 years.

Present Management. It is managed for largemouth bass, northern pike, and panfish. The lake was restocked with fingerling and adult largemouth bass in 1971 following the winterkill. Large fingerling northern pike were stocked in 1974. Although there are no up-to-date reports on what fishermen are catching, the growth and reproduction of largemouth bass and panfish are expected to be above average.

Future Management. A continuation of the dissolved oxygen monitoring program is recommended in anticipation that winterkill conditions could develop necessitating posting it open to dipnetting for salvaging purposes. A year-round fishing season with no size limits for all species and no bag limit on all panfish is recommended. Up-to-date survey data is lacking and a reconnaissance survey should be done to give the monitoring program more significance.

PETERS LAKE, WALWORTH COUNTY

Winterkill History. A consistent dissolved oxygen monitoring program has been carried out since 1969. Winterkills probably occurred in 1951, 1959, and 1971. Heavy precipitation in 1972 and 1973 caused lake levels to reach record heights. Past records suggest that a partial winterkill can be expected an average of once every 10 years. A winterkill is anticipated during the first severe winter after water levels return to normal.

Present Management. It is managed for largemouth bass and panfish. A brief electrofishing survey made in 1974 indicated that goldfish was the dominant species. A church camp located on the lake was contemplating stocking more largemouth bass and introducing northern pike but no stocking permit was received; therefore, it is doubtful that there is much more than goldfish, largemouth bass, and panfish present. Fishing pressure by other than a few local residents is believed to be low. It ranks low as a sport fishing lake.

Future Management. The continuation of the dissolved oxygen monitoring program on an annual basis has questionable value at this time except for comparative purposes. The monitoring program should be carried out during severe winters if a good fishery is known to exist and salvage operations are permissable. A year-round season with no bag and size limits for all species is recommended.

PICKEREL LAKE, WALWORTH COUNTY

Winterkill History. A dissolved oxygen monitoring program has been carried out inconsistently since 1956 and annually since 1969. The potential for a winterkill exists although there are none recorded. Partial kills were probably in 1951, 1959, and 1971. It has an outlet that flows continuously which undoubtedly prevented winterkill during severe winters. It has the potential for a partial winterkill an average of at least once every 10 years.

Present Management. It is managed for largemouth bass, northern pike, and panfish. There is no up-to-date information on species growth rates or numbers. Limited public access reduces fishing pressure and its importance as a sport fishing lake.

Future Management. Dissolved oxygen monitoring is recommended only during severe winters, since it is relatively deep and has a good turnover rate. No changes in fishing regulations are recommended. It is also directly connected to Lake Beulah.

RICE LAKE, WALWORTH COUNTY

Winterkill History. The only severe winterkill recorded was in 1971. It has been monitored during most winters since 1970. Low water levels and heavy vegetative growth are key factors in determining whether or not winterkill will occur. Record rainfall in 1972 and 1973 raised levels to record heights. However, as water levels return to normal, the probability of a winterkill will increase. It can be expected to partially winterkill an average of at least once every 10 years.

Present Management. It is managed for largemouth bass, northern pike, and panfish. Growth rates improved on bluegills since the winterkill in 1971. Bacterial and fungus infections on most species have been noted since 1967 and could increase the probability of winterkill if water levels drop and there is a severe winter. Fishing pressure has always been heavy during the winter but has noticeably increased during the open water season in recent years. Presently, it has one of the best bluegill fisheries in Walworth County.

Future Management. Annual dissolved oxygen monitoring is recommended. Water levels are expected to recede and as they do, the threat of winterkill will increase. A year-round fishing season with no size limits for all species and no bag limit on panfish is recommended.

RUSKIN LAKE, WALWORTH COUNTY

Winterkill History. No records of winterkill are known but its shallow depth suggests that it probably winterkills every year. It has not been field checked in recent years but due to record rainfall in 1972 and 1973, there may be enough deep water to maintain a fishery. Its area and depth are variable. A 1956 report lists it as being 35 acres in area and 15 feet deep. A 1966 lake map indicates it is about 13 acres in area with a maximum depth of 3 feet.

Present Management. Until an up-to-date survey can be made, it can be considered to be managed for forage and panfish species. There is no public access and therefore it has never been stocked. It ranks low as a sport fishing lake.

Future Management. A brief field survey should be conducted to evaluate its status. At this time dissolved oxygen monitoring is not recommended. However, a year-round season with bag or size limits for all species is recommended.

SHANGRILA-BENET LAKE, KENOSHA COUNTY

Winterkill History. Dissolved oxygen monitoring has been done inconsistently since 1951. The only recorded winterkill was a partial one that occurred in 1959. Annual monitoring has been done every year since 1969. The lake has several basins that are liable to winterkill during severe winters. It can be expected to partially winterkill an average of once every 20 years.

Present Management. It is managed for largemouth bass, northern pike, and panfish. The best fishing is for largemouth bass but occasionally crappie fishing is excellent. Northern pike were stocked in 1974 in an effort to increase their number but there has been no indication that this was successful. Fishing pressure is erratic but is heaviest during the summer months. It can be regarded as one of the best fishing lakes for largemouth bass in Kenosha County.

Future Management. The dissolved oxygen monitoring program should be continued on an annual basis in anticipation that a partial or severe winterkill is possible and the information might be needed to substantiate posting the lake open to dipnetting. The information is also important for the maintenance of good public relations with lake residents. Liberal regulations are not recommended at this time.

SILVER LAKE, KENOSHA COUNTY

Winterkill History. Dissolved oxygen monitoring has been carried out inconsistently since 1956 when the first severe winterkill was recorded. The records also indicate that severe winterkills occurred in 1964, 1969, 1970, 1971 and 1972. Record rainfall in 1973 raised levels to record heights so a fishery could be established. As water levels recede, winterkill conditions will return. It can be expected to severely winterkill an average of at least once every two years.

Present Management. It is managed for forage and panfish species. Unknown persons introduced yellow perch since water levels have risen, and fishing reports indicate that their growth rates are very good. Other fish species may also have been stocked. Fishing pressure is believed to be moderate at this time but could increase markedly within the next few years if water levels remain high. At the present time, it ranks low as a sport fishing lake.

Future Management. Until water levels drop and it winterkills again, dissolved oxygen monitoring is recommended to substantiate an imminent winterkill so the lake could be posted open to dipnetting for salvaging purposes. A year-round fishing season with no bag or size limits for all species is recommended.

SWIFT LAKE, WALWORTH COUNTY

Winterkill History. Dissolved oxygen monitoring has been done inconsistently since 1969. It probably winterkilled during the severe winters of 1951, 1959, and 1971 and may have winterkilled between 1966 and 1971. A netting survey in 1966 found a population of large panfish. It can be expected to partially winterkill an average of at least once every five years.

Present Management. It is managed for panfish and forage species. Gamefish may have been stocked by unknown persons. There is no public access so there has been little interest in its management. Healthy, rapidly growing populations of panfish are probably present. Record high water levels reached in 1973 will help to prolong the life of the fishery. Fishing pressure is unknown but is believed to be low. Its rank as a sport fishing lake is considered low.

Future Management. A monitoring program should be carried out on an annual basis to substantiate posting the lake open to dipnetting for salvaging purposes if a winterkill is shown to be imminent. A year-round season with no bag or size limits for all species is recommended.

TRAPP LAKE, WALWORTH COUNTY

Winterkill History. Dissolved oxygen monitoring was done in 1959, 1960, and 1970. There has never been a winterkill recorded; however, if water levels become low enough, a winterkill is possible because of the muck bottom and dense growth of aquatic vegetation present in the basin. Good turnover rates and the high water quality of its principal tributary, Bluff Creek, account for its lack of recorded winterkill. Its frequency of probable winterkill is unknown at this time.

Present Management. It is managed for largemouth bass, northern pike, and panfish. Little is known about the status of its fishery. In recent years fishing success for largemouth bass has been good. Fishing pressure is heavy at times both in the winter and during the open water season. It is considered a good fishing lake.

Future Management. The monitoring program should be carried out only in the severest winters. If monitoring is done, it should be correlated to the exchange rate in the basin. A change in fishing regulations is not recommended at this time.

WANDAWEGA LAKE, WALWORTH COUNTY

Winterkill History. Records indicate that winterkill conditions have been monitored since 1936. Severe winterkills occurred in 1936, 1951, 1958, 1959, 1963, and 1971 and one probably occurred in 1964. It was one of the first lakes to winterkill in 1971. Record rainfall in 1973 raised water levels to record heights; however, as water levels recede, winterkill conditions can be expected to return. A severe winterkill is probable an average of at least once every four to seven years.

Present Management. It is managed for largemouth bass, northern pike, and panfish. Largemouth bass fingerlings and adults were stocked in 1971. Large northern pike fingerlings were stocked in 1974. A good bass, northern pike, and panfish population is believed to be present. Public access has been restricted since it was restocked so fishing pressure is considered to be low. It can be considered only as a fair sport fishing lake at this time.

Future Management. The monitoring program should be continued on an annual basis to substantiate posting it open to dipnetting for salvaging purposes if dissolved oxygen levels indicate that a winterkill is imminent. A year-round season with no bag or size limits for all species is recommended.

DISCUSSION AND RECOMMENDATIONS

Characteristics of Winterkill Lakes

The tendency of a lake to winterkill appears to be directly related to its physical character, ecology, and water levels and to the severity of the winter. The winterkill lakes in this report range from 22 to 946 acres in surface area and have a maximum depth of from 3 to 31 feet. In most of the chronic winterkill lakes, maximum depths ranged from 3 to 14 feet. Out of 22 potential winterkill lakes in the three counties, 17 are landlocked or have short-term, intermittent outlets, and five have perennially flowing inlets and/or outlets. Eighteen lakes have 50 percent or more of their shoreline in marsh; three have 30 to 49 percent marsh shoreline; one has less than one percent of its shoreline in marsh. The predominant bottom types in all of the winterkill lakes are muck and silt. They also have a high percentage of their shoreline in emergent and submergent vegetation.

These factors probably could account for the high biological and biochemical oxygen demands during the winter months. The winterkill records indicate that severe winterkills occurred in years with one or more of the following combinations: heavy, early snows that persist for long periods through most of the winter; colder than average temperatures resulting in thick ice; below-average water levels; heavy vegetative growth; a lack of any thaw or rains. Records point out that the most severe winters occurred in 1935-36, 1944-45, 1950-51, 1959-60, and 1970-71.

The existing fishery in any of the 22 lakes was directly related to frequency and extent of winterkill, success and type of planned restocking, and the possibilities of being restocked naturally from contiguous waters.

From a sport fishing standpoint, lakes that are landlocked or have short-term intermittent outlets and were restocked within one year after a severe winterkill had the most desirable fishery within two years. The common restocking program consisted of putting in a combination of either adult or fingerling largemouth bass, northern pike, and channel catfish. Panfish usually were restocked illegally by local residents. In cases where lakes are not restocked, forage species such as fathead minnows and panfish such as black bullheads that usually survive a winterkill will, subsequently, repopulate a lake.

After a severe winterkill there is a lack of competition between fish species and there are usually large amounts of food available in the form of zooplankton, insect life and forage species. In most cases, this results in extremely fast growth of the restocked fish and their first offspring during the first two or three years following a winterkill. For this reason it is generally not necessary to interrupt the imposed liberal regulations with more conservative regulations until restocked fish have reached maturity for spawning purposes. Adult fish are recommended for initial restocking but fry of largemouth bass and northern pike are easier to obtain and are commonly used.

Past experience has shown that there is little fishing for gamefish during the first two years after the stocking of fry. Also, data collected from chemically rehabilitated lakes and others in southeast Wisconsin has indicated that stocked fry of largemouth bass and northern pike can be expected to reach spawning size within two years. However, there may be a point reached in the growth of such stocked gamefish species when they will be attractive to anglers and still not have spawned but no population imbalance or other significant problem is expected on winterkill lakes since their fish populations can be expected to be in jeopardy at least once every five or ten years.

The length of fishing success and quality after restocking can be expected to remain high for about five to seven years providing there is not another severe kill in the interim and/or a species like carp is not introduced before a more desirable fishery is established. Seventeen of the 22 lakes in this report fall in this category, and 12 of the 17 contain no carp now and probably never will unless someone stocks them.

Management Recommendations

Presently, all the lakes in this report are included in the general regulations for inland waters. If a winterkill is diagnosed as imminent, the lake has to be posted open for dipnetting pursuant to Administrative Code NR 20.04(b). Tests for dissolved oxygen must be conducted before the order can be promulgated and the lake is posted open. If conditions are very severe, the lake may lose its dissolved oxygen supplies before there is an investigation to substantiate posting it open. In these cases, the fishery probably will be lost before it can be salvaged.

In most cases, the records are complete enough to suggest that liberal regulations be recommended. It is possible to manage most of these lakes as a special type of water and possibly develop a high-yield recreational fishery through more liberal regulations. This is recommended because of their precarious susceptibility to partial or severe winterkill in any given year. The intensive management of lakes that can be expected to winterkill at least once every five years should include a year-round season for all species with no bag limits or size limits unless it can be assured that equipment is standing by to aerate large enough volumes of water to alleviate winterkill conditions.

Waters that can be expected to winterkill at least once every 10 years should have dissolved oxygen levels monitored at least once each winter, preferably in early January, to aid in determining whether or not a winterkill is imminent. Also, such knowledge can be used in plans for possible restocking. Information on water levels, turnover rates, and snow and ice conditions should also be gathered when doing this monitoring. If liberal regulations are in effect, such monitoring results would still be necessary to justify posting a particular water open to dipnetting and/or maintaining up-to-date management records. Also, such monitoring can prove to be very significant for public relations purposes by helping to maintain the Department's credibility with the general public now and in the future.

In summary, liberal regulations are recommended for lakes whose past records indicate that they can be expected to have a severe winterkill at least once every five or ten years. This will enable as much angler harvest as possible in the proceeding years in a sportsmanlike manner assuming the probability that most of the current fish population may be lost due to oxygen depletion during any future winter season. The posting of a lake open to dipnetting would still need to be substantiated by current dissolved oxygen measurements pursuant to NR 20.04(b). It must be recognized that some segments of the public whether they be sportsmen's groups or lake associations may object to liberalized gamefish regulations especially on 10-year recurring winterkill lakes. In this report more conservative regulations are proposed on 10-year winterkill lakes where a public relations problem regarding liberal regulations could be expected.

The Future

If a statewide dissolved oxygen monitoring program on potential winterkill lakes was as complete as the one carried out in Walworth, Kenosha, and Racine Counties, it might be possible to get a statewide listing of potential winterkill lakes in each county. Liberalized regulations on these lakes could then be drafted with the effect that fishery resources, which are presently being lost to winterkill each year, might be better utilized by the fishing public. Since there are considerable winterkill records in Walworth, Racine and Kenosha Counties, it is suggested that such a liberalized management program be initiated here first on an experimental basis.

A comprehensive listing of such lakes, by county, complete with an explanation of the program and with a format similar to that of this report, is possible. It would necessarily have to be revised from time to time as additional information is gathered. However, since it would be a separate set of fishing regulations specific for winterkill lakes, it may only need revision once every three or five years. It is believed that in this way the fishery manager would be able to manage winterkill waters in a positive way and have more assurance that the optimum sustained yield concept was being fulfilled. It would also serve to direct the fishing public to these lakes to better utilize fisheries that might otherwise be wasted.

ACKNOWLEDGEMENTS

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Dist.: Fish Mgrs., Spec., Wtrs. Inv.
PIO's

APPENDIX I: Data Summaries for 22 Potential Winterkill Lakes.

Data in these summaries were taken exactly as they appeared in the files with notes presented in their original wording. This was done to get as true a picture as possible from the individual manager who did the sampling. A dashed line indicates no data available.

Location of Sample	Sample Date	Thickness of Ice (In.)	Water Depth (Ft.) At Sample Site	Water Depth (Ft.) Of Sample	D.O. (ppm)	Water Temp.(°F)	Observations
Camp Lake							
--	2/07/51	--	14	Surface	0.5	--	Heavy snow cover
--	2/07/51	--	14	14	0.2	--	Heavy snow cover
75 yards off	1/03/52	--	--	Surface	11.7	--	
south shore	1/03/52	--	--	Bottom	11.2	--	
300 yards off	1/03/52	--	--	Surface	13.0	--	
south shore	1/03/52	--	--	Bottom	10.9	--	
--	2/3-9/56	--	--	1	7.1	--	
--	2/3-9/56	--	--	9.5	6.3	--	
South end	2/18/65	10	4	2	9	--	Overcast
North end	2/18/65	12	10	2	11	--	Overcast
North end	2/18/65	12	10	8	7	--	Overcast
South	3/02/65	10	3	1	8	--	Ice rotten; shoreline open
North	3/02/65	10	10	2	12	--	Ice rotten
"	3/02/65	10	10	7	8	--	
Outlet	3/29/65	--	--	--	8	--	Open water
North End	2/03/66	--	17	8	9	34	3" snow
Outlet at dam	2/03/66	--	Open water	Surface	8	--	Overcast
South End	2/22/66	12	--	--	10	--	Overcast
North end	2/22/66	12	--	9	8	--	Overcast
Deepest part of lake at north end	1/28/69	24	19	10	7	38	½" snow, fog
Just above dam	2/10/70	Open water	--	Surface	1.0	34	Dead crayfish observed, overcast
--	2/10/70	18	5	Surface	2.0	--	½" snow, overcast
--	2/10/70	18	5	4	1.0	--	½" snow, overcast
Deepest part of	2/10/70	17	19	6	2.0	33	½" snow in patches,
lake	2/10/70	17	19	15	1.0	33	overcast
North end	1/25/71	15	19	9	5	--	
North end	2/04/71	20	18	5	3	--	Fog
North end	2/04/71	20	18	10	2	--	Fog
North end	2/04/71	20	18	16	2	--	Fog
South end	2/04/71	20	4	2	1	--	2"-6" snow, fog
South end	2/10/71	24	6	2	2	--	No snow
South end	2/10/71	24	6	4	2	--	No snow
North end	2/10/71	24	18	4	2	--	
North end	2/10/71	24	18	8	1-2	--	
North end	2/10/71	24	18	16	1-2	--	
North end	2/14/71	24	18	5	2	--	
North end	2/14/71	24	18	9	3	--	
North end	2/14/71	24	18	16	3	--	
South end	2/14/71	24	6	3.5	21	--	
North end	2/17/72	15	18.5	7	11	--	Cloudy
North end	2/17/72	15	18.5	14	4	--	Cloudy
South end	2/17/72	15	5.5	2.5	7	--	Cloudy
South end	2/21/73	10.0	5.5	3.0	8.0	32	1"-2" snow, partly cloudy
North end	2/21/73	10.0	19.0	5.0	9.0	33	1"-2" snow, partly cloudy
North end	2/21/73	10.0	19.0	14.0	3.0	33	1"-2" snow, partly cloudy
South end	1/10/74	12	5.5	3	10.0	34	4" snow, snowy
South end	2/12/75	8	5	4	7	34	1"-3" snow, partly cloudy
North end	2/12/75	9	18.5	4	8	34	1"-2" snow, partly cloudy
North end	2/12/75	9	18.5	10	7	34	1"-2" snow, partly cloudy
North end	2/12/75	9	18.5	17	4	34	1"-2" snow, partly cloudy

Location of Sample	Sample Date	Thickness of Ice (In.)	Water Depth (Ft.) At Sample Site	Water Depth (Ft.) Of Sample	D.O. (ppm)	Water Temp. (°F)	Observations
Como, Lake							
--	2/19/51	18	--	Surface	5.3	--	Partial kill
--	2/3-9/56	--	--	1	9.2	--	
800 feet west	1/15/59	13	--	Surface	5.3	--	2" crusted snow
of Schroeder's Resort	1/15/59	13	--	.5	3.8	--	2" crusted snow
500 feet from outlet	1/15/59	12	--	1.5	6.7	--	
700 feet off shore							
from end of road	1/15/59	12.5	--	Surface	5.1	--	
past Bender's Resort	1/15/59	12.5	--	5	8.0	--	
End of road	2/04/59	16	--	Surface	2.1	--	Snow depth ave. 10"
End of road	2/04/59	16	--	6	0.8	--	Snow depth ave. 10"
West side	2/11/59	16	--	Surface	0.3	--	6" water & slush
West side	2/11/59	16	--	5.5	none	--	6" water & slush
From Brandy's Resort	2/04/59	16	--	Surface	0.4	--	See above
From Brandy's Resort	2/04/59	16	--	2.5	none	--	See above
300 feet from							
spring feeder	2/11/59	14	--	Surface	4.0	--	See above
Schroeder's Resort	2/04/59	16	--	Surface	0.5	--	See above
Schroeder's Resort	2/04/59	16	--	4.5	0.6	--	See above
Schroeder's Resort	2/11/59	16	--	Surface	0.8	--	See above
Schroeder's Resort	2/11/59	16	--	5	none	--	See above
Near Mar's Resort	2/04/59	16	--	Surface	1.1	--	6" water & slush
Near Mar's Resort	2/04/59	16	--	6.5	0.7	--	See above
200 feet lakeward							
from outlet	2/20/60	11	--	2.5	8.4	--	Little snow cover
400 feet from shore	4/20/60	9	--	Surface	18.9	--	See above
end of Lake Shore Dr.	4/20/60	9	--	7	15.5	--	See above
300 feet offshore	4/20/60	13	--	Surface	13.4	--	See above
from Schroeder's Resort	4/20/60	13	--	5	9.1	--	See above
400 feet offshore end	3/10/60	12	--	Surface	10.1	--	4" snow
of Lake Shore Drive	3/10/60	12	--	6.5	2.5	--	4" snow
Edge of ice at outlet	3/10/60	Open water	--	2	1.1	--	
300 feet offshore from	3/10/60	18	--	Surface	0.4	--	8" snow
Schroeder's Resort	3/10/60	18	--	5	2.8	--	8" snow
525 feet offshore west	3/38/60	14	--	Surface	7.4	--	Slush & snow on ice
end of Lake Drive	3/28/60	14	--	7	2.2	--	Slush & snow on ice
At outlet open water							
above dam	3/28/60	Open water	--	Surface	0.8	--	
300 feet offshore from	3/28/60	14	--	Surface	1.2	--	2" slush & snow
Schroeders Resort	3/28/60	14	--	5	0.1	--	on ice
600 feet offshore end	2/2-3/62	18	--	Surface	2.4	--	5" crusted snow
of Lake Shore Drive	2/2-3/62	18	--	6	2.1	--	5" crusted snow
380 feet offshore	2/2-3/62	14	--	Surface	1.6	--	7" crusted snow
Schroeder's Resort	2/2-3/62	14	--	4.5	0.5	--	7" crusted snow
550 feet offshore end	2/09/62	18	--	Surface	0.8	--	½" snow
of Lake Shore Drive	2/09/62	18	--	7.5	0.2	--	½" snow
350 feet offshore	2/09/62	20	--	Surface	0.7	--	1.5" snow
Schroeder's Resort	2/09/62	20	--	5	none	--	1.5" snow
300 feet west of	2/06/63	23	--	Surface	6.1	--	3" crusted snow,
Schroeder's Resort	2/06/63	23	--	5	5.2	--	spotty
Within 60 feet							
of aerator	2/06/63	18	--	Surface	5.6	--	4 aerators in lake at various locations
500 feet offshore	2/06/63	22	--	Surface	4.7	--	3" crusted snow,
west end of Lake Dr.	2/06/63	22	--	7	2.7	--	spotty
400 feet from aerator	2/06/63	24	--	Surface	5.7	--	4" crusted snow,
& small streamflow	2/06/63	24	--	4	4.0	--	spotty
400 feet off from	3/06/63	22	--	Surface	8.2	--	2" snow
Schroeder's Resort	3/06/63	22	--	6	5.7	--	2" snow
500 feet offshore end	3/06/63	22	--	Surface	10.1	--	2" snow
of North Shore Dr.	3/06/63	22	--	7	8.7	--	2" snow
Juniper Lane in the	1/16/65	--	4	Surface	10.0	--	Sunny, light snow
the Como Beach area	1/16/65	--	4	3	7.0	--	Sunny, light snow
--	2/04/65	10	4	2	6.0	--	8" snow; ice opaque; 2 aerators

Location of Sample	Sample Date	Thickness of Ice (In.)	Water Depth (Ft.) At Sample Site	Water Depth (Ft.) Of Sample	D.O. (ppm)	Water Temp. (°F)	Observations
--	2/16/65	12	5	2	5.0	--	Ice opaque, partly cloudy
50 feet from outlet	3/01/65	6	3	1	8.0	--	Ice opaque, cloudy
250 feet north of Schroeder's Access	3/01/65	12	5	2	12.0	--	Ice opaque to translucent, cloudy
At outlet	3/29/65	--	--	--	5.0	--	
Schroeder's Road	3/09/65	--	--	2	6.0	--	
Schroeder's Road	3/29/65	--	--	4	6.0	--	
Southwest end	2/03/66	--	5	2.5	10	--	3" snow, overcast
Center	2/03/66	--	8	4	11	37	2" snow, overcast
Northeast end	2/03/66	--	4	2	9	36	3" snow, overcast
West end	2/23/66	12	--	4	12	--	Overcast
Schroeders	2/23/66	12	--	2.5	13	--	Overcast
East end	2/23/66	12	--	2	15	--	Overcast
Out from public landing, Southeast end	1/19/67	8	--	1	14.0	--	Clear, Winkler Kit
	1/19/67	8	--	4.5	13.0	--	
	1/19/67	8	--	1	12.0	--	Clear, Hach Kit
Off landing near Schroeder's	2/03/67	--	--	3	14	--	Cloudy, Winkler Kit
	2/03/67	--	--	5	14	--	
Public landing at outlet	2/14/67	--	4.5	4	12.2	--	Thaw in progress
	2/14/67	--	5	Surface	8.0	--	Good flow
--	2/27/67	--	--	Surface	13.5	--	Light snow cover;
--	2/27/67	--	--	5	12.3	--	overcast
Outlet	2/27/67	--	--	--	8.2	--	
East end	1/30/69	18	8	3	12	37	2" water, cloudy
West end	1/30/69	18	8	2	5	38	2" water, cloudy
--	1/16-18/70	14	5	2.5	2	--	2" snow
East end	1/25/71	14	4	2	2	--	
West end	1/25/71	14	6	3	2	--	
East end	2/06/71	21	5	Surface	2	--	
East end	2/06/71	21	5	4	2	--	
West end	2/06/71	21	5	Surface	2	--	
West end	2/06/71	21	5	4	2	--	
East end	2/10/71	24	4	2	1	--	
Center	2/10/71	24	6	Surface	1	--	
Center	2/10/71	24	6	3	1	--	
West end	2/10/71	24	8	Surface	2	--	
West end	2/10/71	24	8	4	1-2	--	
West end	2/10/71	24	8	6	1-2	--	
West end	2/23/72	18	8	4	11	32	4-6" snow, overcast
Center	2/23/72	16	8	4	4	32	4-6" snow, overcast
East end	2/23/72	17	8	4	11	32	4-6" snow, overcast
West end	2/14/73	9.5	8.5	4	3.0	34	2-4" snow, overcast, snow flurries
West end	2/14/73	9.5	8.5	7	2.0	34	2-4" snow, overcast, snow flurries
Lake in general	2/14/73	--	--	No sample	--	--	Area of open water
West end	1/19/74	12	8.5	3	5.0	34	1-3" snow, cloudy
West end	1/19/74	12	8.5	7	6.0	34	Deepest part of lake, cloudy
East end Schroeder's Resort	1/19/74	13	4.5	3	10.0	34	1-3" snow, cloudy
Off Schofield Road	2/18/74	15	4.5	3.0	7.0	34	2-3" snow, overcast
West end	2/18/74	15	9.0	4.0	9.0	34	Deepest part of
West end	2/18/74	15	9.0	7.0	2.0	34	lake, overcast
East end	2/14/75	9	4	3	5	34	1-2" snow, cloudy
West end	2/14/75	9	9.5	4	8	33	1-2" snow, cloudy
West end	2/14/75	9	9.5	8	4	33	1-2" snow, cloudy
Lake Comus							
100 feet east of dam	2/11/59	17	--	4	0.1	--	9" snow, winterkill
Near Willow Grove, East shore	2/11/59	17	--	3	1.1	--	9" snow

Location of Sample	Sample Date	Thickness of Ice (In.)	Water Depth (Ft.) At Sample Site	Water Depth (Ft.) Of Sample	D.O. (ppm)	Water Temp. (°F)	Observations
Near Marshy Point, west shore	2/11/59	17	--	2.5	0.9	--	9" snow
Outlet on Dam Road	2/2-3/62	4	--	Surface	8.4	--	6" crusted snow
--	1/18/65	8	--	3	6	--	Partly snow covered, clear
--	2/04/65	15	3	2	4	--	6" snow, sunny
--	2/16/65	10	4	2	4	--	Ice opaque
--	3/01/65	12	5	2	5	--	1.5" snow
--	2/16-18/70	14	5.5	2.5	10	--	1.5" snow
Dyer Lake							
--	1/16/51	--	7	Surface	4.1	--	
--	1/16/51	--	7	7	1.5	--	
South end	1/03/52	--	--	Surface	16.0+	--	
South end	1/03/52	--	--	Bottom	16.0+	--	
Center	1/03/52	--	--	Surface	11.5	--	
Center	1/03/52	--	--	Bottom	4.9	--	
--	2/3-9/56	--	--	1	7.5	--	
--	2/3-9/56	--	--	10	7.0	--	
--	2/18/65	6	12	2	4	--	Open 2" around shore, overcast
--	2/18/65	6	12	6	3	--	Overcast
--	3/02/65	8	16	2	8	--	8" rotten ice; shoreline partly open
Deepest part of lake	1/31/69	18	9	4.5	3	36	Clear
Deepest part of lake	2/10/70	17	13	5	1.0	34	½" snow, overcast
Deepest part of lake	2/10/70	17	13	12	4.0	34	½" snow, overcast
Deepest part of lake	2/04/71	18	13	3	0	--	Partial kill
Deepest part of lake	2/04/71	18	13	6	0	--	evidenced in spring,
Deepest part of lake	2/04/71	18	13	11	0	--	fog
Near deepest part of lake	3/01/72	16	9.5	5	11	33	2-3" snow
Deepest part of lake	2/19/73	8.0	13.5	8.0	10.0	3	4" snow, overcast
Deepest part of lake	2/19/73	8.0	13.5	11.0	6.0	3	4" snow, overcast
Deepest part of lake	1/18/74	11	13.5	4	10.0	34	1-2" snow, fog
Deepest part of lake	1/18/74	11	13.5	8	7.0	34	1-2" snow, fog
Deepest part of lake	1/18/74	11	13.5	12	4.0	34	1-2" snow, fog
Deepest part of lake	2/14/75	10	12	4	8	32	1-3" snow, cloudy
Deepest part of lake	2/14/75	10	12	10	3	32	1-3" snow, cloudy
Ivanhoe, Lake							
Center of lake	1/15/59	13	--	Surface	5.8	--	3" crusted snow
Center of lake	1/15/59	13	--	7	5.3	--	3" crusted snow
400 feet off	2/13/59	20	--	Surface	3.7	--	5" slush
south shore	2/13/59	20	--	9	1.2	--	5" slush
600 feet off	2/13/59	20	--	Surface	2.1	--	5" slush
north shore	2/13/59	20	--	9	0.9	--	5" slush
300 feet offshore	3/06/63	21	--	Surface	11.1	--	2" snow
on east side	3/06/63	21	--	8	10.9	--	2" snow
--	1/18/65	8	--	3	14	--	Ice clean, sunny
--	2/04/65	8 (opaque)	6	2	12	--	8" snow, sunny
--	2/16/65	10	8	3	2	--	Ice opaque
--	2/16/65	10	8	5	5	--	Ice opaque
--	3/01/65	10	8	2	7	--	Water turbid, light rain
--	3/29/65	10	8	2	≤3.0	--	6" slush
--	3/29/65	10	8	6	<1.0	--	6" slush
Near inlet	2/03/66	--	6	3	7	36	1" snow, overcast
Near outlet	2/03/66	--	5	10	6	36	1" snow, overcast
South end	2/22/66	16	--	4.5	3	20	3" snow, overcast
North end	2/22/66	16	--	3.5	4	20	3" snow, overcast

Location of Sample	Sample Date	Thickness of Ice (In.)	Water Depth (Ft.) At Sample Site	Water Depth (Ft.) Of Sample	D.O. (ppm)	Water Temp. (°F)	Observations
--	1/16-18/70	11	10	3	3	--	2" snow
--	1/16-18/70	11	10	8	2	--	2" snow
Deepest part of lake	2/16/71	--	11	Surface	<1	--	Partial kill
Deepest part of lake	2/16/71	--	11	5	0	--	probably
Deepest part of lake	2/16/71	--	11	8	0	--	occurring
Near deepest part of lake	3/01/72	15	9	4	8	--	2-3" snow, fog
Northeast end	2/14/73	9.5	9.5	4	2.0	34	2" snow, flurries
Northeast end	2/14/73	9.5	9.5	8	1.0	34	2" snow, flurries
Near deepest part of lake	2/18/74	15	9	4	3.0	34	4" snow, overcast
	2/18/74	15	9	8	3.0	34	4" snow, overcast
Near deepest part of lake	2/14/75	9	10	4	4	34	1-3" snow, cloudy
	2/14/75	9	10	9	9	34	1-3" snow, cloudy
Lilly Lake							
--	2/24/41	--	--	--	6.1	--	
--	1/16/51	--	6	Surface	0.5	--	Snow on lake
--	1/16/57	--	6	6	0	--	Snow on lake
50 yards off public beach, west side	2/15/55	--	--	Surface	3.1	--	3" snow
	2/15/55	--	--	Bottom	2.3	--	3" snow
--	2/3-9/56	--	--	1	9.2	--	
--	winter-1959	--	--	--	0	--	Severe winterkill
West side	2/18/65	8	4	2	10	--	Overcast
East side	2/18/65	8	4	2	6	--	Overcast
West side (beach)	3/02/65	8	4	2	10	--	Ice rotten
West side	2/03/66	--	8	4	12	--	8" snow, overcast
East side	2/03/66	--	6	3	11	--	8" snow, overcast
West end	2/22/66	12	--	3	11	--	3" snow, overcast
East end	2/22/66	18	--	3.5	10	--	3" snow, overcast
--	1/29/69	15	4	2	6	35	½" snow, cloudy
East side 150 yards from aerator	2/10/70	19	5	3	8.0	34	½" snow, overcast
West side 100 yards from 2nd aerator	2/10/70	18	5	3	4.0	34	½" snow, overcast
East end 150 yards from aerator	1/25/71	13	5	2.5	4	--	
West end 100 feet from aerator	1/25/71	13	4.5	2.0	3	--	
East side	2/04/71	19	5	4	1-2	--	2-4" snow, fog
East side	2/04/71	19	5	2	1-2	--	2-4" snow, fog
West side	2/04/71	19	4	2	3	--	Fog
East side	2/10/71	22	5	2.5	2	--	
West side	2/10/71	22	5	2.5	2	--	
East end	2/14/71	20	5	2.5	21	--	
West end 50 feet from aerator	2/14/71	20	6	2	2	--	
	2/14/71	20	6	4	3	--	
West end	3/01/72	15	4	2	9	33	
West end	2/21/73	4.5	5.5	3.0	4.0	34	1-2" snow, cloudy
West side	1/10/74	11	5.5	3	9.0	34	4" snow, snowy
--	2/14/75	9	6	4	7	36	1-2" snow, cloudy
Long Lake							
--	2/24/41	--	--	--	11.7	--	
--	2/3-9/56	--	--	1	12.4	--	
--	2/3-9/56	--	--	5	11.4	--	
--	winter-1957	--	--	--	6.2	--	
North end	1/31/69	18	5	2.5	7.0	41	No snow, clear
North end	2/10/70	18	5	3	3.0	33	Overcast
North end	2/14/75	9	6	4	7	34	1-2" snow, cloudy
South end	2/14/75	7	8	3	9	34	3" snow, cloudy
South end	2/14/75	7	8	7	7	34	3" snow, cloudy

Location of Sample	Sample Date	Thickness of Ice (In.)	Water Depth (Ft.) At Sample Site	Water Depth (Ft.) Of Sample	D.O. (ppm)	Water Temp. (°F)	Observations
Lorraine, Lake							
--	2/3-9/56	--	--	1	1.7	--	
--	winter-1957	--	--	5.5	4.0	--	
400 feet off	2/27/60	11	4	Bottom	7.3	--	
south shore	2/27/60	11	4	Surface	9.2	--	
200 feet south off High Point	2/27/60	10	3	--	4.1	--	
500 feet off	3/38/60	18	--	Surface	0.5	--	Slush, snow and
north shore	3/28/60	18	--	5.5	0.2	--	water on top of ice
South end of lake	2/2-3/62	13	--	Surface	1.0	--	10" crusted snow
in dredged area	2/2-3/62	13	--	5	0.2	--	10" crusted snow
South end of lake	3/21/63	18	--	Surface	0.4	--	Winterkill
in dredged area	3/21/63	18	--	6	1.8	--	imminent
South end of lake in dredged area	12/7/64	10	4	Surface	3	--	Very low water levels
North end	2/04/66	--	5	2.5	4	--	8" snow, clear
South end	2/04/66	--	4	2	7	--	8" snow, clear
North end	2/23/66	8	--	2	8	--	4" snow, overcast
South end	2/23/66	8	--	2	11	--	4" snow, overcast
--	1/16/67	8	--	1.5	6.0	--	Cloudy
--	1/16/67	8	--	3	4.0	--	Cloudy
--	2/03/67	4-6	--	3.5	11.2	--	4-6" snow, clear
--	2/14/67	10	4	1.2	3.8	--	2-3" snow, clear
--	2/14/67	10	4	4	2.6	--	2-3" snow, clear
--	2/27/67	10	--	4	3.0	--	Cloudy
--	2/27/67	10	--	5	3.8	--	Cloudy
Deepest	1/30/69	18	4	3	2.5	34	Cloudy
--	2/16-18/70	10	2	Surface	1	--	2" snow
Note: No samples taken in 1971. Lake assumed to have winterkilled during 1970-71 winter which was severe. Also, it winterkilled in 1969-70 winter.							
Deepest part of lake	2/20/72	17	4	2	15	33	2-4" snow, clear
East central	2/14/73	7.0	5.5	2.5	3.0	36	2-4" snow, flurries
East central	1/11/74	11	8.5	4	4.0	32	8" snow, clear
North central	2/18/74	14	9.0	4	2.0	35	2-4" snow, overcast
North central	2/18/74	14	9.0	8	5.0	35	2-4" snow, overcast
Deepest part of lake	2/14/75	11	9.5	4	6	33	1-2" snow, cloudy
Deepest part of lake	2/14/75	11	9.5	8	6	33	1-2" snow, cloudy
Montgomery Lake							
--	2/24/41	--	--	--	17.3	--	
--	1/16/51	--	7	Surface	4.8	--	
--	1/16/51	--	7	7	2.8	--	
--	2/3-9/56	--	--	1	7.5	--	2-3" snow
--	2/3-9/56	--	--	10	7.0	--	2-3" snow
--	2/18/65	6	16	2	9	--	Overcast
--	2/18/65	6	16	9	7	--	Overcast
--	3/30/65	6	24	2	11	--	2" slush on ice
--	3/30/65	6	24	7	7	--	2" slush on ice
East end	2/22/66	--	--	2.5	10	--	3" snow, overcast
West end	2/22/66	--	--	10	8	--	Overcast
--	1/28/69	15	4	2	6	35	½" snow, fog
South center	2/10/70	18	6	3	3.0	34	½" snow, overcast
West side	1/25/71	15	9	4.5	5	--	
West side	2/04/71	20	14	3	2	--	2-6" snow, fog
West side	2/04/71	20	14	7	2	--	2-6" snow, fog
West side	2/04/71	20	14	10	<1	--	2-6" snow, fog
West side	2/10/71	18	7	4	2	--	Cloudy
West side	2/10/71	18	7	6	2	--	Cloudy
Deepest part of lake	2/14/71	24	23	5	1	--	Clear
Deepest part of lake	2/14/71	24	23	11	<1	--	Clear
Deepest part of lake	2/14/71	24	23	19	<1	--	Clear

Location of Sample	Sample Date	Thickness of Ice (In.)	Water Depth (Ft.) At Sample Site	Water Depth (Ft.) Of Sample	D.O. (ppm)	Water Temp. (°F)	Observations
North end	2/17/72	15	22	8	9	35	Cloudy
North end	2/17/72	15	22	18	5	35	Cloudy
Deepest part of lake	2/21/73	9.0	19.5	5.0	11.0	34	1-2" snow, clear
Deepest part of lake	2/21/73	9.0	19.5	15.0	5.0	34	1-2" snow, clear
Near deepest part	1/18/74	11	18.5	5	8.0	34	1.3" snow; rain,fog
Near deepest part	1/18/74	11	18.5	15	5.0	34	1.3" snow; rain,fog
Near deepest part	2/12/75	9	19	6	7	36	1-2" snow; partly cloudy
Mud Lake							
Deepest part of lake	1/28/69	18	12	6	4	39	½" snow, fog
Deep part of lake	2/20/73	7	10.0	7.0	5.0	35	2" snow
Center of lake	1/18/74	12	13	5	2.0	35	1-3" snow, fog
Center of lake	1/18/74	12	13	11	5.0	35	1-3" snow, fog
Deep part of lake	2/12/75	10	13	5	7	36	1-2" snow, partly cloudy
Deep part of lake	2/12/75	10	13	11	2	36	1-2" snow, partly cloudy
No. 10 Lake							
--	2/16-18/70	Frozen solid	--	--			Three holes
Note: Heavy precipitation in 1973 may have raised water levels to record highs; a fishery may now be established.							
North Lake							
Northeast	3/08/55	8	--	Surface	6.0	--	More snow than ice
Northeast	3/08/55	8	--	3	4.0	--	More snow than ice
Southeast	3/08/55	13	--	Surface	0.5	--	Snow cover
Southeast	3/08/55	13	--	4.5	0	--	Snow cover
--	3/3-9/56	--	--	1	4.6	--	
Northwest end	2/2-3/62	13	--	Surface	1.2	--	10" crusted snow
Northwest end	2/2-3/62	13	--	4	0.8	--	10" crusted snow
Open water 25' from shore	2/26/63	18	--	3	2.7	--	Aerator operating
Open water of aerator	3/23/63	On lake	--	Surface	7.5	--	Aerator operating
60' from aerator	3/22/63	19	--	4	1.2	--	Aerator operating
700' from aerator	3/22/63	19	--	3	2.4	--	Aerator operating
300' north of public access	1/30/69	2.5	2.5	2.5	0	--	Frozen solid,cloudy
Three holes	2/16-18/70	Frozen solid					
South end	2/19/73	9.0	4.0	2.0	5.0	35	2-3" snow, overcast
South end	2/18/74	14.0	7.5	4.0	1.0	35	1-4" snow, overcast
Off public access south end	1/27/75	8	8	7	7.0	33	½" snow, overcast
Pell Lake							
--	2/15/55	--	4	Surface	10.4	--	
--	2/15/55	--	4	4	9.8	--	
--	2/3-5/56	--	--	1	9.7	--	
--	2/2-5/56	--	--	7	9.3	--	
25' off north shore	2/4/59	15	--	Surface	1.6	--	11" snow
25' off north shore	2/4/59	15	--	7	2.7	--	11" snow
200' off north shore	2/13/59	20.5	--	Surface	0	--	5" slush
200' off north shore	2/13/59	20.5	--	12	0.8	--	5" slush
Off north shore	1/15/59	11+	--	Surface	6.9	--	1" crusted snow
Off north shore	1/15/59	11+	--	5	6.3	--	1" crusted snow
Off south shore	1/15/59	11+	--	Surface	7.0	--	1" crusted snow
Off south shore	1/15/59	11+	--	4	5.3	--	1" crusted snow
375' off north shore	2/20/60	9	--	Surface	8.7	--	4" snow
375' off north shore	2/20/60	9	--	8	2.4	--	4" snow
400' off north shore	3/10/60	16	--	Surface	1.7	--	8" snow
400' off north shore	3/10/60	16	--	7	0	--	8" snow

Location of Sample	Sample Date	Thickness of Ice (In.)	Water Depth (Ft.) At Sample Site	Water Depth (Ft.) Of Sample	D.O. (ppm)	Water Temp. (°F)	Observations
60' off shore in	3/28/60	18	--	Surface	3.6	--	Slush, water, ice
dredged area south shore	3/28/60	18	--	4.5	0	--	Slush, water, ice
360' off shore	3/28/60	16	--	Surface	2.1	--	Slush, water on ice
in deep basin	3/28/60	16	--	12	0.2	--	Slush, water on ice
north shore	3/28/60	16	--	16	0	--	Slush, water on ice
400' off shore	2/09/62	20	--	Surface	0.7	--	1" snow
from north shore	2/09/62	20	--	7	0.5	--	1" snow
450' off north shore	3/06/63	23	--	Surface	10.5	--	2" snow
250' of aerator	3/06/63	23	--	7	9.6	--	
Open water of aerator	3/06/63	0	--	--	11.3	--	Open water
--	1/18/65	8	--	1	11	--	No snow, clear
--	1/18/65	8	--	7	9	--	No snow, clear
--	2/04/65	8	6	2	7	--	4" snow, clear
--	2/16/65	8	16	2	4	--	Opaque ice, cloudy
--	2/16/65	8	16	7	5	--	Opaque ice, cloudy
--	3/01/65	6	16	5	11	--	Opaque ice, overcast light rain
--	3/29/65	6	13	2	10	--	2" snow, 2" slush
--	3/29/65	6	13	3	7	--	2" snow, 2" slush
--	3/29/65	6	13	9	4	--	2" snow, 2" slush
North end	2/03/66	--	6	3	11	--	4" snow, overcast
South end	2/03/66	--	12	6	6	--	4" snow, overcast
North end	2/22/66	12	--	5	9	--	3" snow, overcast
South end	2/22/66	15	--	3	4	--	3" snow, overcast
--	1/30/69	18	6	3	9	38	Trace of snow, cloudy
--	1/16-18/70	11	5	3	2	--	1.5" snow
Deepest part of lake	1/25/71	13	9	Surface	1	--	
Deepest part of lake	1/25/71	13	9	4.5	1	--	
Deepest part of lake	2/25/72	17	7	3.5	8	32	Cloudy
--	2/14/73	Too thin to walk	50 Yards of open water around aerators in southeast and southwest corners				
East central	1/19/74	11	14	4	4.0	34	1" snow, 2 aerators
East central	1/19/74	11	14	11	6.0	34	operating, cloudy
Near deepest part	2/14/75	11	12	4	11	33	1-3" snow, cloudy
of lake	2/14/75	11	12	10	9	33	1-3" snow, cloudy
Peters Lake							
Deepest part of lake	1/31/69	18	4	3	2	--	Clear
--	2/16-18/70	10	5	2.5	6	--	2" snow
Southeast corner	2/19/73	9.5	6.5	3.0	9.0	34	3" snow, overcast, drizzle
East end	2/18/74	15.0	11.0	5.0	4.0	34	6" snow, partly cloudy
--	2/14/75	12	11	4	3	34	2-4" snow, cloudy
--	2/14/75	12	11	10	3	34	2-4" snow, cloudy
Pickerel Lake							
--	2/3-6/56	--	--	1	7.0	--	
--	2/3-6/56	--	--	11	5.9	--	
Deepest part of lake	1/31/69	24	30	15	3+	40	Clear
Deepest part of lake	2/19/73	14.0	29.0	16.0	5.0	33	3" snow, overcast, misty fog
Deepest part of lake	2/18/74	13.0	30.0	5	5.0	33	4" snow, partly cloudy
Deepest part of lake	2/18/74	13.0	30.0	15	2.0	33	4" snow, partly cloudy
Deepest part of lake	2/14/75	16	29	5	7	34	2-4" snow, cloudy
Deepest part of lake	2/14/75	16	29	15	5	34	2-4" snow, cloudy
Deepest part of lake	2/14/75	16	29	28	<1	34	2-4" snow, cloudy
Rice Lake							
--	2/16-18/70	11	7	Surface	4	--	2" snow
--	2/16-18/70	11	7	7	3	--	2" snow

Location of Sample	Sample Date	Thickness of Ice (In.)	Water Depth (Ft.) At Sample Site	Water Depth (Ft.) Of Sample	D.O. (ppm)	Water Temp. (°F)	Observations
Deepest part of lake	2/14/73	9.5	9.5	4.0	4.0	--	2-5" snow, overcast
Deepest part of lake	2/14/73	9.5	9.5	8.0	4.0	--	2-5" snow, overcast
Deepest part of lake	1/11/74	12	10	3	11.0	34	6" snow, clear
Deepest part of lake	1/11/74	12	10	7	9.0	34	6" snow, clear
Deepest part of lake	2/14/75	10	11	4	9	34	1-2" snow, cloudy
Deepest part of lake	2/14/75	10	11	10	9	34	1-2" snow, cloudy
Ruskin Lake							
Note: A very shallow lake - really a marsh. Probably winterkills every year. Heavy rains in 1973 may have raised water levels enough to support a fishery; needs to be checked. Managed for forage species.							
Shangrila, Lake							
--	2/07/51	--	--	Surface	2.0	--	
--	2/3-9/56	--	--	1	2.2	--	2-3" snow
--	2/3-9/56	--	--	9	0.7	--	2-3" snow
Jo Ann's Resort	2/18/65	--	10	2	10	--	Overcast
Jo Ann's Resort	2/18/65	--	10	7	6	--	Overcast
East of road	2/18/65	--	--	2	10	--	Overcast
Jo Ann's Resort	3/02/65	8	11	2	7	--	8" rotten ice
Jo Ann's Resort	3/02/65	8	11	7	8	--	with open spots
West bay	2/03/66	--	12	6	6	--	6" snow, overcast
East bay	2/03/66	--	11	5	6	--	6" snow, overcast
West bay	2/22/66	14	--	6	11	--	3" snow, overcast
East bay	2/22/66	14	--	6	6	--	3" snow, overcast
--	1/28/69	24	13	7	9	39	½" snow, fog
--	1/28/69	24	10	5	7	39	½" snow, fog
North end	2/10/70	15	12	5	2.0	34	½" snow in patches,
North end	2/10/70	15	12	10	2.0	34	overcast
South end	2/10/70	17	13	6	2.0	34	½" snow, overcast
South end	2/10/70	17	13	11	2.0	34	½" snow, overcast
East bay	2/04/71	20	7	4	3	--	4" snow, fog
East bay	2/04/71	20	7	7	3	--	4" snow, fog
East bay	2/10/71	18	12	5	3	--	
East bay	2/10/71	18	12	10	3	--	
East bay	2/17/72	16	12	5	9	33	Cloudy
East bay	2/17/72	16	12	10	8	33	Cloudy
Northeast basin	2/20/73	7.0	12.0	4.0	8.0	35	
Northeast basin	2/20/73	7.0	12.0	9.0	5.0	35	
--	1/18/74	13	11	4	9.0	35	½" snow cover, fog
--	1/18/74	13	11	9	4.0	35	½" snow cover, fog
--	2/12/75	9	13	7	7	36	½" snow, partly cloudy
--	2/12/75	9	13	12	6	36	½" snow, partly cloudy
Silver Lake							
--	2/3-9/56	--	--	1	0	--	Probable winterkill
--	12/7/64	Lake nearly dry					
--	1/30/69	2.5	2.5	Frozen solid			
--	2/16-18/70	8	2	Surface	3	--	2" snow
Northeast end	2/19/73	6.5	4.0	2.0	14.0	35	3" snow, open water in center, overcast
West central	2/18/74	13.5	6.5	4.0	5.0	34	1-5" snow, partly cloudy
--	2/14/75	12	7	4	9	35	1-3" snow, cloudy
Swift Lake							
Southwest side	1/31/69	18	3.5	2	2	37	Clear
Southwest side	1/31/69	24	6	3	1	38	Clear

Location of Sample	Sample Date	Thickness of Ice (In.)	Water Depth (Ft.) At Sample Site	Water Depth (Ft.) Of Sample	D.O. (ppm)	Water Temp. (°F)	Observations
--	2/16-18/70	9	5	2.5	2	--	1" snow aerator operating
Southwest end	2/19/73	11.0	6.0	3.0	14	34	3" snow, mist,fog
West central	2/18/74	12.5	11.0	5.0	4.0	34	6" snow, partly cloudy
Deepest part	2/14/75	8	13.5	5	3	34	2-4" snow, cloudy
Deepest part	2/14/75	8	13.5	12	3	34	2-4" snow, cloudy
Trapp Lake							
200' from dam	2/18/59	18	--	Surface	7.9	--	4" crusted snow
200' from dam	2/18/59	18	--	3.5	7.2	--	4" crusted snow
100' above outlet dam	2/27/60	9	--	Surface	7.4	--	
100' above outlet dam	2/27/60	9	--	7	1.9	--	
--	2/16-18/70	12	4.5	4	8	--	3" snow
Wandawega, Lake							
--	2/3-9/56	--	--	1	12.0	--	
Center of lake	1/15/59	13+	--	1.5	1.5	--	Winterkill imminent, cloudy
120' out from high point on Northwest shore	3/10/60	15	--	3	4.9	--	3" snow
Center of dredged area east	3/10/60	15	--	Surface	0.4	--	
	3/10/60	15	--	7	none	--	
300' north shore west end	3/28/60	16	--	Surface	4.8	--	
	3/28/60	16	--	4.5	5.7	--	
Center of dredged area east end	3/28/60	15	--	Surface	1.8	--	Slush, water on ice
	3/28/60	15	--	8	0.7	--	Slush, water on ice
Dredged area east end	2/2-3/62	15	--	Surface	3.6	--	8" snow, plowed in some areas
	2/2-3/62	15	--	8	2.5	--	
Dredged area east end	2/09/62	19	--	Surface	0.8	--	2" crusted snow
	2/09/62	19	--	9	2.8	--	2" crusted snow
250' off shore west end of lake	3/06/63	24	--	4	0.5	--	7" snow
100' off shore from public access, 75' from aerator	3/06/63	23	--	Surface	0.8	--	Aerator operating
	3/06/63	23	--	9	0.6	--	Aerator operating
Open water of aerator east end	3/22/63	--	--	Surface	1.6	--	Aerator operating, dead fish present
	3/22/63	--	--	4	0.3	--	
Dredged area east end	12/7 & 9/64	--	6	--	8.0	--	Ice opaque, three samples
	12/23/64	--	6	Surface to bottom	3.0	--	
--	1/18/65	8	6	1	7	--	Light snow cover, clear
--	1/18/65	8	6	6	6	--	
--	2/04/65	12	5	2	3	--	6" snow, clear
--	2/16/65	--	6	2	2	--	Ice opaque
--	3/01/65	10	6	2	7	--	Ice opaque, light rain
--	3/29/65	10	5	2	3	--	4" snow, 4" slush
--	3/29/65	10	5	4	2	--	4" snow, 4" slush
East end	2/04/66	--	4	2	2	--	4" snow, clear
West end	2/04/66	--	4	2	10	--	4" snow, clear
East end	2/23/66	12	--	1.5	8	--	2" snow, overcast
West end	2/23/66	9	--	2	5	--	2" snow, overcast
Off beach	2/14/67	--	4.5	Surface	7.6	--	2-3" wet snow,clear
East end	2/14/67	--	4.5	4	7.0	--	2-3" wet snow,clear
--	2/27/67	--	--	Surface	8.0	--	
--	2/27/67	--	--	5	7.2	--	
West end center	1/30/69	24	5	2.5	6.0	34	
--	2/16-18/70	10	3	2	2	--	2" snow
East end	1/25/71	--	6	3	0	--	Report of dead fish, strong odor of H_2S
Center of lake	2/20/72	15	5	2.5	11.0	33	2-4" snow, cloudy
North central	2/19/73	9.5	6.5	3.5	11.0	35	3" snow, overcast
North central	2/18/74	15	7.0	3.5	5.0	34	1-6" snow, overcast
--	2/14/75	12	8.5	3	9	34	2-4" snow, cloudy
--	2/14/75	12	8.5	7	9	34	2-4" snow, cloudy

TABLE 1. Physical characteristics, history, management, and regulation recommendations for potential winterkill lakes in Walworth, Kenosha, and Racine Counties, Wisconsin.

LAKE NAME	COUNTY	PHYSICAL CHARACTERISTICS									FLOW OF OUTLET AND CONTROL	WINTERKILL HISTORY			FISHERY CHARACTERISTICS				RECOMMENDED REGULATIONS		
		Surface Acreage	Maximum Depth (Ft.)	% Muck and Silt Bottom			% Marsh Shoreline					Last Documented Winterkill (year)		Average Years Between Winterkills	Present Species** Management	Status of Carp		Possible Carp Reinfestation	No Season, no bag or size limit-all species	No Season, no bag or size limit-panfish	County Regulations
				0-29	30-50	50+	0-29	30-50	50+			Partial	Severe			Absent	Present Problem				
Camp	Kenosha	461	19			X			X	Intermittent; low head dam		1971	1952	10	LMB, NP, We, pf		X	Yes			X
Como	Walworth	946	8			X			X	Intermittent; low head dam with barrier		1971	1936	10	LMB, NP, cc, pf		X	No			X
Comus	Walworth	117	5			X			X	Perennial; low head dam		none	1959	20	LMB, NP, pf		X X	Yes			X
Dyer	Kenosha	56	13			X			X	Intermittent; low head dam		1951	1971	10	LMB, NP, pf	X		No	X		
Ivanhoe	Walworth	41	11			X			X	Perennial; no dam		1971	none	10	LMB, NP, pf	X		Yes		X	
Lilly	Kenosha	87	6			X	X			Landlocked		1971	1959	10	LMB, NP, pf	X		No	X		
Long	Racine	124	5		X				X	Perennial; no dam		1971	none	10	LMB, NP, pf		X	Yes		X	
Lorraine	Walworth	133	5			X			X	Landlocked		none	1971	5	LMB, NP, cc,pf	X		No	X		
Montgomery	Kenosha	46	23			X			X	Intermittent; no dam		1971	none	10	LMB, NP, pf	X		No		X	
Mud	Kenosha	22	14			X			X	Intermittent; no dam		1971	none	10	LMB, NP, pf		X	Yes	X		
No. 10	Walworth	34	3			X			X	Landlocked		none	annual	2	pf, forage	X		No	X		
North	Walworth	244	11			X			X	Landlocked		1968	1972	2	LMB, NP, pf	X		No	X		
Pell	Walworth	86	13			X			X	Intermittent; no dam		1960	1971	10	LMB, NP, pf	X		No		X	
Peters	Walworth	64	8		X			X		Landlocked		none	1971	5	LMB, pf	X		No	X		
Pickerel	Walworth	30	31			X			X	Perennial; no dam		1971	none	10	LMB, NP, pf		X	Yes			X
Rice	Walworth	137	10		X			X		Intermittent; dam		none	1971	10	LMB, NP, pf	X		Yes		X	
Ruskin	Walworth	12	3			X			X	Landlocked		none	annual	1	Forage, pf	X		No	X		
Shangrila-Benet	Kenosha	154	24			X			X	Intermittent; dam		1959	none	20	LMB, NP, pf		X X	No			X
Silver	Walworth	85	4			X			X	Landlocked		none	1972	2	LMB, pf	X		No	X		
Swift	Walworth	19	12		X			X		Landlocked		none	1971	5	pf, forage	X		No	X		
Trapp	Walworth	115	6			X			X	Perennial; dam		*	*	*	LMB, NP, pf		X	No			X
Wandawega	Walworth	119	9		X			X		Landlocked		none	1971	5	LMB, NP, pf	X		No	X		

* Unknown
** LMB – Largemouth bass
NP – Northern pike
We – Walleye
pf – panfish
cc – channel catfish